

What is claimed is:

1 1. A method for simulation modeling where the simulation model
2 includes individual blocks in a block diagram structure wherein each of the
3 individual blocks include equation sets of a physical model, comprising the steps
4 of:
5 configuring said blocks in a block diagram structure;
6 utilizing commercial simulation software to solve said equation sets of
7 said blocks;
8 ordering said blocks in said block diagram structure to allow for
9 waveform relaxation of sets of variables of said blocks; and
10 performing waveform relaxation of said sets of variables of said blocks.

1 2. The method of claim 1, wherein said step of ordering said blocks in
2 said block diagram structure includes decomposing said block diagram into
3 subsystems.

1 3. The method of claim 1, wherein said step of ordering said blocks in
2 said block diagram structure includes identifying said sets of variables of said
3 blocks.

1 4. The method of claim 1, wherein said step of ordering said blocks in
2 said block diagram structure includes adding a low fidelity model of one of said
3 blocks.

1 5. The method of claim 4, wherein said substep of adding said low
2 fidelity model of one of said blocks includes deriving an error signal from an
3 output of said one of said blocks and an output of said low fidelity model.

1 6. The method of claim 5, wherein said step of ordering said blocks in
2 said block diagram structure includes accelerating convergence of said
3 simulation model by processing said error signal.

1 7. The method of claim 1, wherein said step of performing waveform
2 relaxation includes deriving a sparse interconnect matrix.

1 8. The method of claim 7, wherein said step of performing waveform
2 relaxation includes weakly-coupling said equation sets.

1 9. The method of claim 8, wherein said step of utilizing said
2 commercial simulation software includes running said commercial simulation
3 software on a plurality of data processors.

1 10. The method of claim 9, wherein said step of running said
2 commercial software on said plurality of data processors includes waiting until
3 each of said commercial simulation software has completed calculations before
4 transmitting interprocessor communications data.

1 11. The method of claim 1, wherein said equation sets change in
2 subsequent iterations of said simulation model.

1 12. The method of claim 11, wherein said equation sets increase in
2 fidelity in subsequent iterations of said simulation model.

1 13. The method of claim 1, wherein said step of performing waveform
2 relaxation utilizes Gauss-Jacobi methods.

1 14. The method of claim 1, wherein said step of performing waveform
2 relaxation utilizes Gauss-Seidel methods.

1 15. A computer readable medium having stored thereon instructions
2 which when executed cause the computer to perform the steps of:
3 configuring said blocks in a block diagram structure;
4 utilizing commercial simulation software to solve said equation sets of
5 said blocks;
6 ordering said blocks in said block diagram structure to allow for
7 waveform relaxation of sets of variables of said blocks; and
8 performing waveform relaxation of said sets of variables of said blocks.